Gateway

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The ARRL Packet-Radio Newsletter

JAPAN PACKET RADIO USERS' GROUP

The following information is from Bob, WA3PXX, who has been appointed US correspondent for JPRUG.

PRUG in Japan would like to be informed about packet activity in the US. I will be sending in a contribution to their monthly newsletter about activity here in the states. Please send me traffic [at WA3PXX BBS] about anything that would be of interest to (J)PRUG. I hope to receive newsletters from them in the future. I will send out bulletins with copies of the (J)PRUG newsletter to the major BBSs in the area. Let's let them know about the problems and successes we have had!

From JF1LZQ:

History of (J)PRUG - A few years ago, JAMSAT obtained two TNC 1 Beta-test boards and made the first two-way packet QSO in Japan on 144 MHz. But they were so busy developing the JAS-1 (FO-12) satellite that they could not propagate packet radio very well.

Last year, some Japanese amateurs developed the first original Japanese TNC (using AX.25 Ver 1.0), called "PARNET TNC," and some American amateurs living in Japan obtained some TNC 1 and GLB TNCs. We, the (J)PRUG staff, were friends of both groups and started this users' group. Afterwards, many TNC 2 clones came into Japan, and the number of packeteers has been increasing. There seem to be more than five thousand packet users in Japan now.

Activity now - Most of the packeteers in Japan are using the 435-MHz band. Activity on the 14- and 1200-MHz bands is increasing too. Of course, there are a lot of BBSs, some of which are W0RLI/WA7MIL type. Also, we are putting digipeaters on mountain tops. The most serious problem is channel sharing with voice stations.

About (J)PRUG - We have about 300 members covering most area(s) of Japan, and the activities are as follow:

1. Publishing PRUG NEWS once a month.
2. Running the open Unix system:
   Host: HK-68k
   CPU: 68000
   Disk: 40 Mbyte
   OS: UNIX System V
   Etc: Four ports (two for 435 MHz, one for 1.2 GHz and another for the local console) are available at the same time. A C compiler and LISP interpreter are available.
3. Writing papers for the packet radio columns of two of the ham radio magazine in Japan.

NEW YORK FREQUENCY PLAN

These frequencies have been recommended by the New York State Packet Federation (NYSPF) for use for packet radio operation. All frequencies are in MHz. [Publication of this recommendation does not imply approval by the ARRL or Gateway.]

6 Meters:
- 51.910 - National packet calling, linking and DX frequency
- 51.930 - Packet LAN/linking
- 51.950 - Packet LAN/linking
- 51.970 - Packet LAN/linking
- 51.990 - Packet LAN/linking

2 Meters:
- 144.970 - Station-to-station file transfers and digital experiments (no digipeaters or BBSs)
- 144.990 - Station-to-station file transfers and digital experiments (no digipeaters or BBSs)
- 145.010 - National packet calling and DX frequency. In the future, use of this frequency for local BBS access, file transfers and QSOs will be discouraged in high-traffic areas where alternate (LAN) paths are available.
- 145.030 - Local area networks
- 145.050 - Local area networks
- 145.070 - Local area networks
- 145.090 - Local area networks
- 145.510 to 145.590 (20-kHz channels)* - Alternate LAN frequencies for high-traffic areas or dual-frequency systems.

1-1/4 Meters:

No formal recommendation is being made at this time, but the following frequencies are in use in some areas:
- 220.550 - Experimental point-to-point linking
- 221.010 - Backbone digipeater linking (9600 bauds)
- 221.110 - Backbone digipeater linking (9600 bauds)

3/4 Meters and above*:
- 446.800 - LANs and linking (all uses)
- 446.825 - LANs and linking (all uses)
- 446.850 - LANs and linking (all uses)
- 446.875 - LANs and linking (all uses)
- 446.900 - National packet calling and DX frequency

* Tentative recommendation

Your comments and suggestions are welcome. Address them to Phil Bradley, Chairman NYSPF, KB2HQ @ N2AYY.

From Dan Whelan, WB2WHD

C64 LOCAL BBS AND MAIL-DROP PROGRAM

[The Commodore 64 packet BBS mentioned briefly in Gateway Volume 3, Number 8, is described more fully here by its author. The author can be contacted by writing to: Bob Bruninga WB4APR, 59 Southgate Ave, Annapolis, MD 21401.]

This frequency-agile local BBS (LBBS) software has been available for over a year and fills a specific niche as a BBS satellite of a regional full function WØRLI/WA7MIL BBS system. It is WØRLI compatible but is limited in capacity to about 30 messages, or 20 kbytes. Its best feature is easy uncongested access to its users on its own LAN frequency since it will QSY for forwarding as needed. The prototype system serves our local club admirably on its own frequency of 145.09 MHz, with about a dozen active users. There are at least four or more big BBSs in the Baltimore/Washington metropolitan area on 145.05 MHz to serve bulk-data and file-transfer needs. The C64 system can be made to operate with two ports, such as HF/VHF, but the limited message capacity would restrict its use to not much more than a local mail drop. The program is available on tape or send a formatted disk to the address given above along with a $5 "hassle factor" contribution.

I apologize to those who find my constant tweaking of the program frustrating, but every time I make even the slightest program change, even to change a call sign in my forwarding table, I save a new version under a new file name. Since the program is always on line, I respond to letter requests simply by copying that program onto your disk. The purpose of this article is to summarize where the program is and to offer some hints to holders of older versions. The following list chronicles the major changes by version number:

28.6 First reasonably reliable version ready for public use
35.3 Removed GATEWAY function
43.3 Added four-frequency QSY forwarding capability
48.5 Improved forwarding timeouts, added flag for FILE status
48.9 Fixed MSG reload anomaly by chopping lines to 80 characters before saving to disk.
49.0 CONO off during SYSOP use, and local CR/LF during entry
49.2 Separate MSG and FILE files. New LOAD & SAVE commands. Bulletin download feature. Improved "in use" display.
49.4 Added direct connects to PORT1/2. Fixed dimension of q%().
49.48 Fixed "SB" problem
49.5 Echoed local CR/LF to SYSOP at 70 chars, improved dual-port handshaking, and added /EX message terminator.
49.7 Added Welcome time and date. Remove quotes at time 0200 even if tape not used. Accept CR response to FILE? prompt.
49.8 Added autopurge of forwarded messages, fixed NTS traffic handling, and improved memory management for accept/reject forwarding.
49.9 Converted forwarding format line to WØRLI standard.
50.0 Doubled garbage collect speed by removing T$, F$, & V$ arrays (requires convert.5 program to change old messages to new format)
50.06 Fixed kill/privacy bug. Fixed memory-management prompt logic.
50.11 Changed to WØRLI date format. (50.12 fixed bugs)

HINTS: To prevent missing connect requests on a busy channel, turn MALL off so that only UNPROTO packets are monitored. The only disadvantage to this is that your heard log will no longer show the status of any connected traffic on the channel. Secondly, to prevent a "string too long" error, set SCR 80 to insert CR's on those novice operators who type infinite-length lines. Third, since string management becomes slower as free memory approaches zero, try to keep the BBS cleaned so at least 5 kbytes of RAM remain. Finally, you can put special notes and headlines in your TNC C-msg buffer in place of, or in addition to, the logon text to give an immediate response to a user when he logs on.

I cannot promise to answer all correspondence, but I would appreciate a message from everyone who is on line stating what version, TNC, PORT and frequency configuration they are running. I am aware of the following systems that are operational:

NG2G WD4KAV KA3KIW KB2M N2EZG KC2FY WB5SXK N1DKF WØDG KØCNM KØCY WA4BRO WB5OLT KP4EKG N2FNI VE2ED WB4WOR WA8HFV WAØCQG K5ARH N5BSL

FUTURE: The present single-tier forwarding structure (@ BBS) requires every BBS to know every other BBS in order to make routing decisions without manual intervention. Expecting SYSOPs across the country to keep track of every C64 LBBS or Mail-Drop program is not practical. For this reason, I have suggested a two level system which adds an optional "& BBS" to the present "@ BBS" system which would require an LBBS to be known only to its regional neighbors. [See Gateway Volume 3, Number 8.]

WESTNET BBS SYSTEMS LINKED TO NEW MEXICO AND TEXAS

WESTNET packet BBS systems are now linked on VHF to systems in New Mexico and Texas via WB7BNI. With this addition, VHF forwarding covers all or part of California, Colorado, New Mexico, Texas and Utah.

From Bill Pasternak, WA6ITF

DRAFT SKIPNET OPERATIONS PLAN RELEASED

A draft of an Interim Operations Plan for Amateur Radio Ionospheric Packet Autoforwarding Net (SKIPNET) has been sent to the ARRL Ad Hoc Committee on Amateur Digital Communication and to the HF packet BBS stations involved in the plan. This plan is the result of the HF survey conducted earlier, as reported in Gateway, Volume 2, Number 25.

The plan involves use of propagation predictions to determine the most desirable forwarding paths in the HF network. The Committee and the HF operators are asked to comment on the proposal, with a view toward early implementation on a trial basis.

From Paul Rinaldo, W4RI

NETWORK MANAGEMENT: A GROWING NEED

manage - ...to treat with care...
(Webster's Ninth New Collegiate Dictionary)

Recent efforts to establish network planning and management in a number of regions have met with some resistance from packet operators. The situation is not unlike that which prevailed in the early days of VHF voice repeaters, in which many repeater owners and users resisted coordination until it could no longer be put off. Eventually, the need became so pressing and obvious that opposition melted (well, most of it) and a rational system of frequency use became common.

Amateur packet radio is rapidly approaching, if not already at, a state equaling the worst of the uncoordinated voice repeater problems. If we are to increase the usefulness and pervasiveness of packet, we must quickly get our house in order. Since the idea of a structured network is opposed in some quarters, perhaps it is time to take a close look at the situation, with particular emphasis on the possible solutions.

As anyone who operates in an even mildly congested packet environment can attest, the most significant problems we face today are long delays and restricted path lengths. By long delays, I mean that the end-to-end data transfers are subject to numerous retransmissions, requiring much more time to get a specified number of characters transferred to the other end of the link than would be required in an uncongested environment. Restricted path lengths are imposed when connections through more than a few digipeaters (the number varies from region to region) are unusable, either because the TNCs "retry out" after a number of retransmissions or because the delays involved render the link ineffective.

As it turns out, these problems are two sides of the same coin: collisions. A collision occurs when two packet stations transmit simultaneously, with one of the stations being unreadable at its intended receiver. The most common example of this is when two stations are trying to transmit through the same digipeater. If they both transmit at the same time, only one can possibly be properly received by the digipeater. If both signals are of nearly the same strength at the digipeater, chances are that neither signal will be properly received. It is not always apparent that this is the mechanism causing the delays encountered during a connection, but it is nearly always so. TNCs are designed to defer their transmission if another packet signal is heard on frequency. The operative word here is if. Take the case of the mountaintop digipeater being used by stations on different sides of the mountain. Since they can't hear one another, they often will transmit at the same time. To each operator, the frequency seems clear, but to the digipeater there are two competing signals. Thus is a collision born.

Of course, on a multiple-digipeater path, the potential for collisions exists at the receiver of each digipeater along the path, as well as at the destination TNC. It is this increased collision rate that makes a multiple-digipeater path fail more readily than a single-digipeater path. It is my observation that most of the problems encountered are with collisions between a digipeater transmission and that of another station, either another digipeater or home station. (This observation is based on what signals I can see from my location, not on hard statistical evidence.)

One way of reducing the number of collisions is to move the digipeaters to separate frequencies, much as is done with voice repeaters. The problem is that, since the digipeaters could no longer hear one another, doing so would eliminate the multiple-digipeater paths that have become such an integral part of packet radio. There are technical solutions to this loss of linking. The principal one is the use of multiple-port digipeaters. Such machines have two ports that operate independently, one on the local-user frequency and one on the linking frequency. As the name implies, the local-user frequency is the frequency on which local stations communicate with the digipeater. The linking frequency is used strictly to communicate with other digipeaters. Multiple-port digipeaters exist today and are being operated in a number of locations throughout the country. Nonetheless, present-day packet radio operates mostly through the use of single-port machines.

The approach to the congestion problems taken in many areas has been to recommend frequencies for specific uses. Usually, one or more frequencies get set aside for long-haul linking between digipeaters and/or BBS systems, with several frequencies allocated to local use. The local-use frequencies are often separated by intended use, such as local-user access to BBS systems, bulk-data transfers and the like. [The New York State Packet Forum plan described elsewhere in this issue of Gateway is an example of such a plan.] In an environment of single-port machines, this approach makes sense and is a first step toward solving the problem. All of these frequency plans are an attempt to come to grips with the basic problem. One can, perhaps, argue the specifics of a particular plan, but it is hard to see a case against the concept of frequency planning. Anarchy is not a workable solution to the problems of packet radio.

You may have noticed that I have addressed the problems only as they apply to digipeaters. What about the upcoming networking systems? Won't the arrival of network node controllers (NNC), network-layer (and higher) protocols and higher-speed modems solve all of our problems? No, these things, by themselves, do not solve the basic physical-layer problem of collisions. Whether the network nodes in use are simple digipeaters or more intelligent NNCs, the basic collision problem remains. Sure, higher-speed modems would reduce the problem--for a while. The analogy to use is that of the highway. If you convert a congested two-lane road to a superhighway, congestion is eased... until more drivers start using the new road and congestion builds up again. Fortunately, the analogy isn't perfect; we can reduce packet congestion by predetermining the best "roads" to use and easily build new ones where they are needed. The thing is, we need coherent plans in order to make best use of the "roads" we build.

The most desirable system for packet is one in which 1) the transmissions of local users who are

using the network do not collide with those of distant transmitters, and 2) the number of local users using a single network node is limited, to reduce collisions among the local user group. Accomplishing this will require a relatively large number of network nodes, each on a frequency that is not used by other nearby nodes. To accomplish this desirable end, intelligent frequency selection and use is a must. Let's all support these goals by putting together effective regional network management organizations.

By Jon Bloom, KE3Z

GATEWAY ON HOLIDAY!

Because of the holiday season, there will be a three-week hiatus before the next issue of Gateway is published on January 9, 1987.

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